Engagement and Dropping Out of School: A Life-Course Perspective

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by
Richard Audas and J. Douglas Willms

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This report is part of a set of research studies on the National Longitudinal Survey of Children and Youth. / Le présent rapport fait partie d'un ensemble d'études sur l'Enquête longitudinale nationale sur les enfants et les jeunes.

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Abstract

In this paper the authors review the literature on dropping out of school, with a view to developing an empirical model that can be used for the National Longitudinal Survey of Children and Youth and other longitudinal surveys of child and youth development. The review details a rich and developed literature with a consistent finding of an inverse relationship between dropping out of school and socio-economic status. However, relatively few studies have examined the processes which lead to dropping out, and thus, the literature does not provide a strong base for making policy decisions or designing interventions that might reduce the prevalence of dropping out.

There is growing evidence that "engagement" – the extent to which young people identify with their school and derive a sense of well-being from their academic work – is a crucial determinant of success in school. In addition, considerable evidence suggests paths towards academic success begin at birth. As such, the authors of this paper believe that both a true understanding of the factors associated with dropping out and potential remedies need to be considered as a part of a life-course model. They offer a model that considers six broad categories of factors affecting individuals' chances from early childhood: individual effects, family effects, engagement, peers, schools and communities. The paper concludes with a discussion of possible empirical estimation strategies.

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Foreword

The National Longitudinal Survey of Children and Youth (NLSCY) is a unique Canadian survey designed to follow a representative sample of children from birth to early adulthood. It is conducted in partnership by Human Resources Development Canada (HRDC) and Statistics Canada. Statistics Canada is responsible for data collection, while HRDC, the major funder, directs and disseminates research. Data collection began in 1994 and continues at two-year intervals.

The survey for the first time provides a single source of data for the examination of child development in context, including the diverse life paths of normal development. The survey and the research program were developed to support evidence-based policy, using a human development view of the early decades of life. This research paper is part of an ongoing series of papers emanating from a program of research that examines NLSCY data collected in the first two cycles (1994, 1996) of the survey.

1. Introduction

Dropping out of school is not a single act of defiance, but is better characterized as a process that in many respects begins at birth and can cover many years of an individual's life. Wagenaar (1987) states:

> The precursors to dropping out, the decision to drop out, the process of dropping out, the responses to dropping out and the consequences of dropping out all result from a complex interplay of personal, social, situational and contextual factors.

The over-arching aim of this paper is to define this "complex interplay," and to examine the factors that contribute to the eventual outcome of leaving school prior to graduation. We develop a "life-course model" to identify critical factors during children's lives which influence intermediary outcomes pertaining to the decision to leave school early. We use the term "dropout" to refer to youth whom leave secondary school before graduation, including those who leave but return later, and those who subsequently complete some form of equivalency diploma.

1.1 Policy Challenge

A great deal of research has been done to "profile the characteristics of dropouts and to develop tools to identify children "at-risk"" of dropping out of school or engaging in delinquent or anti-social behaviours. We repeatedly observe that low-achievers and students from low socio-economic status (SES) backgrounds are at a much higher risk of dropping out. Also, dropping out tends to coincide with increased delinquency, teen pregnancy among females and incidents of alcohol drug use and abuse. Researchers have struggled to identify the characteristics that mediate the effects of low SES and poor grades on dropping out, and recently have focused more of their attention on school and community processes. This is promising, as future research needs to go beyond simply finding that individuals from low SES backgrounds are more likely to drop out. The challenge is to achieve a better understanding of the early predictors of dropping out, so that educators can intervene at an early stage in children's school careers, keeping them on a positive path towards school completion.

1.2 Research Challenge

The key problem in terms of analyzing this process is the fundamental relationship between dropping out and many of the factors used to predict it. For instance, the incidence of teen pregnancy and dropping

out are clearly related, but the roots of both outcomes are similar and using both variables in regression models tends to bias estimates. In addition there is often a high degree collinearity between intermediary outcomes and the final decision to leave school. For example, aggressive behavior in children as young as five is an excellent predictor of early school leaving, and a number of factors which have been associated with early school leaving are also positively associated with aggressive behavior in children, making the identification of "pure" influences on dropping out extremely difficult.

While there is considerable evidence indicating that children from low SES backgrounds are more likely to leave school without graduating (i.e., positive achievement/SES gradient), there is little to suggest what exactly it is about being poor that render children prone to dropping out. Several possibilities exist: inadequate parenting; poor schools or teachers; schools with high levels of truancy; pressures to augment family income, accompanied with a view that schooling has limited economic returns; peers with low aspirations; poor nutrition and health; and too few role models in the community.

For policy makers to develop effective interventions, they need to ascertain which factors are most important for identifying school leavers and develop policies that address these issues. For example, if parenting practices are associated with early school leaving, then education programs targeted towards parents may reduce the number of young people dropping out.

One of the key problems with the literature is what statisticians refer to as "omitted variable bias." This occurs when an explanitory variable included in the model is highly correlated with another variable that is not included in the model. If the excluded variable also has a strong influence on the process being explained, then this will bias the effect on the included variable, making identification of the true effect impossible to capture. The challenge for researchers is to utilize fully specified models that incorporate influences from a variety of factors including individual effects, family effects, the influence of schools, peer networks, and the role of communities when looking at school leavers. No empirical examination of the dropout problem to date incorporates all of these factors, and the extent to which omitted factors are correlated with included factors and dropping out, limits our understanding of the process.

1.3 Linking Research to Policy

Most of these factors described above have not received intense investigation. Peer networks, which have been identified by many researchers as playing a critical role in youth development, have never been meaningfully incorporated into a large-scale data collection exercise. The same applies to factors related to health and nutrition. As well, there has been limited work examining how young people use their time, and the extent to which this influences behavior in other aspects of their lives, such as participation in anti-social behavior, engagement in school life, and dropping out of school. Dropping out can be seen as the culmination of a number of problems faced by young people. The research challenge is to probe more deeply into its root causes.

The literature has generally failed to recognize that there are multiple profiles of dropouts and the paths they take toward school leaving are varied. The "typical" dropout is characterized as coming from a poor background, having low levels of academic achievement, being involved in delinquent behavior and exhibiting low-levels of engagement in school and extra-curricular activities. While these observed traits may describe one type of dropout, we believe this is an over-simplification, and focusing on this type of dropout will result in a failure to identify other individuals who may be at-risk of dropping out.

Janosz (1994) devised a typology of dropouts, dividing them into four categories:

- *maladjusted*, who have poor grades and who behave poorly at school;
- *underachievers*, who just have poor grades;
- *disengaged*, who perform better than the maladjusted and the underachievers, but simply do not like school; and
- *quiets*, who, other than having slightly lower grades, resemble graduates more than dropouts.

Maladjusted, and to a lesser extent, underachieving youth, are easier to identify than the "quiets" or "disengaged," as the antecedents of early school leaving become obvious at a young age. Educators and parents may be able to intervene early and take steps to maintain engagement and limit anti-social behavior, which would have the effect of keeping them on the path towards graduating from high school.

Quiet and disengaged youth probably pose a greater challenge, because in many respects they resemble those destined to graduate, and as such are difficult to identify early. Moreover, we expect that interventions designed for keeping one type of individual in school may be ineffective for another.

Another key area where the research is lacking is in finding policy sensitive-variables, thereby providing a means to intervene to reduce the incidence of dropping out. While the research to date provides many good predictors of who will drop out, potential remedies are in short supply. Many of the factors positively associated with dropping out of school are fixed in the sense that there is little that school staff or policy makers can do to change them. It is well-established that individuals coming from low SES backgrounds are considerably more likely to leave school without graduation. The main policy challenge is to identify successful interventions, while keeping in mind that there are multiple dropout profiles. Interventions that retain one individual may have little positive influence on keeping another young person in school.

1.4 Aims of the Paper

We hope to achieve several objectives with this paper. In the next section, we examine the literature on school dropouts, paying particular attention to evidence from large empirical studies, and to smaller studies which are novel in their approach. Findings from the large-scale studies focus on the prevalence of dropping out and are generalizable to a broader population, but usually the data are "thin," lacking measures that can be used to explain why students drop out. The smaller studies tend to have "thick" data, but the populations from which the samples are drawn tend to be idiosyncratic, and thus the findings lack generalizeability. However, these studies offer insights into the process of dropping out, and can inform data collection and analysis in future studies. In particular, there are innovative studies examining differences in peer networks between those prone to dropping out and their counterparts, studies considering the role of early childhood experiences in predicting future school leavers, and studies of the roles of schools and communities. We believe a number of these ideas can be made operational for use in comprehensive surveys of young people, such as Canada's National Longitudinal Study of Children and Youth (NLSCY) and the Youth in Transition Study (YITS).

The evidence suggests that dropping out is a highly complex process which begins early in the lives of young people. However, most of the research has been cross-sectional, or longitudinal but covering short periods, such as two to four years. Also, when the data are longitudinal, the models used to analyse them tend to treat them as cross-sectional, failing to exploit the value of a longitudinal design (e.g., see Willett, Singer, and Martin, 1998). In the third section, we set out a "life course" model which aims to draw attention away from "dropping out," conceived as a single act, to the most important precursors of dropping out – behaviour, academic achievement, and engagement. We maintain that understanding the complex interplay of these factors, their relationship with family background, and the factors which mediate the relationship between family background and school leaving are essential for designing interventions and shaping public policy.

The statistical modeling of complex longitudinal processes is non-trivial and requires well thought out data collection techniques. There have been a number of advances in this area and some particularly promising statistical procedures that have not received much attention in this research. In the last section, we discuss how our proposed life course model might be operationalised with data forthcoming from the NLSCY and YITS, and suggest how these larger efforts could be supplemented with smaller studies focused on particular issues. The long-term objective of this line of research should be to:

1. Better identify risk factors that increase the propensity of individuals to leave school early, with a particular focus on which SES influences have the most important effect.

2. Identify interventions that appear to have had success in keeping at-risk young people in school.

1.5 Limitations

There are aspects of this topic that we do not consider in this paper. First, we do not consider the impact of individuals who return to school after dropping out. A significant proportion of those who drop out of school eventually do return to complete their secondary education, often through a General Educational Development (GED) Certificate or some other form of high school equivalency. However, there is evidence suggesting that the returns to a GED are much lower than that of a conventional high school diploma (see Cameron and Heckman, 1996). While it is important to have institutions in place to

support those who want to return for additional education, there will be a far greater impact if policies can be found that reduce the incidence of dropping out in the first place.

A second aspect of the dropout problem that we do not consider is the extent to which there are biases in schools that make high school completion less likely for poor and minority children, resulting from labeling or from a curriculum that lacks relevance to these young people. While it may be that these biases are occurring, they will be difficult to identify in most large-scale statistical analyses, although we believe that this is an area where qualitative research could have a particularly poignant role. In addition, we believe the policy implications of this practice are already self-evident. Students should not be labeled based on their ethnicity or SES, and practices that maintain prejudices should not be tolerated. In addition, curricula should be culturally sensitive and flexible enough so that minority history and culture is given adequate attention.

A more fundamental issue that we do not address is the returns to or value of secondary education. There is growing evidence of a skills mismatch between labour supply and labour demand and, in light of this, serious questions are being asked about how human capital is best accumulated. Our view is that these are issues in the evaluation of post-secondary education and that a high school education is the principle vehicle through which young people build their "skill platform" that will allow them to become productive members of the adult labour market. While there are high-profile cases of high school dropouts having successful careers, we believe these are rare instances where ability greatly exceeded achievement. We believe there is significant room for debate over school curricula, but see this as beyond the scope of this paper.

2. Literature Review

Broadly speaking, there are four basic kinds of empirical studies of dropouts. While each tends to offer a somewhat different perspective, and add to our enlightenment on the subject, none provide a fully comprehensive life course perspective. There are:

1. Longitudinal and cross-sectional examinations of dropping out using micro-data from nationally representative data sources. These studies have been particularly useful in identifying at-risk young people and developing estimates of the extent of the dropout problem. They include Rumberger (1983), Whelage and Rutter (1986), Barrington and Hendricks (1989), Crane (1991) and Gilbert, Barr, Clark, Blue, and Sunter (1993).

2. Studies employing multilevel statistical models that distinguish between individual effects and school effects. These studies are particularly useful as they allow for a superior identification of effects attributable to youth, and those related to the institutions which they attend. These include Bryk and Thum (1989) and Rumberger and Thomas (2000).

3. "Experimental" studies examining particular aspects of dropping out. These are based on relatively small samples, and therefore are not nationally representative. They tend to resemble qualitative research in many respects, although they are generally large enough to allow for some statistical investigation. They are important in that they provoke alternative ways of thinking about dropping out and developing effective interventions. Two studies that are especially pertinent to understanding dropping out in a life-course perspective are Ensminger and Slusarcick (1992) and Ellenbogen and Chamberlain (1997).

4. Qualitative studies that have employed interviews and focus groups to probe into youth's attitudes. These studies are especially important because school engagement entails student participation, motivation, and values. Research on engagement is in an early developmental stage, and it is only through detailed qualitative study that we will come to understand how youth engage with schools and *vice-versa*. We include two studies in our discussion: Fine (1986) and Tanner, Krahn and Hartnagel (1995).

We found it difficult to integrate the diverse findings of the literature on dropping out without resorting to a "laundry list" approach. Our strategy is to summarize the findings of the "landmark" large-scale studies on dropping out by categorizing the factors predictive of dropping out into five categories, pertaining to individuals, families, peers, schools, and communities. Then, in discussing the various studies, we treat the large-scale studies as the *backbone* to the literature, attempting to identify the over-arching and consistent findings that are generalizable to large populations. The smaller-scale experimental and qualitative studies – what one might call the *heart and soul* of this literature – are used to elucidate the main themes emerging from the large-scale research.

A summary of the large-scale studies is presented in Table 1. The "effects" on the decision to drop out of school may come from a variety of sources. We have categorized them as follows:

- *Individual effects*: factors that young people have under their control, such as attendance, academic performance, health, engagement in academic and school activities, and participation in anti-social behaviour.
- *Family effects*: SES, parenting styles, household composition, and parents' participation in school activities.
- *Peer effects*: The role of young people's friends and the effects of rejection.
- *School effects*: Quality of teaching and resources, school size, effectiveness and equity of school policies and practices, school climate, and engagement of teachers.
- *Community effects:* The extent to which young people are affected by the neighbourhoods in which they live, and the broader effects of the social, economic, and historical features of their neighbourhoods and communities. An important sub-set of community factors is the role local labour market conditions play in encouraging or discouraging early exit from school.

These categories overlap with each other, and thus a number of factors could be classified in alternative categories. However, we hope that these categories are useful for organizing the many factors related to dropping out, and enable us to identify the important relationships among groupings. In the sections below, more substance to the information in Table 1 is provided.

Table 1 **Summary of Major Studies**

Controls	Rumberger (1983)	Wehlage & Rutter (1986)	Barrington & Hendricks (1989)	Bryk & Thum (1989)	Ensminger & Slusarcick (1992)	Rumberger & Thomas (2000)
Data source	NLS of youth labour market experiences	High School & Beyond (HS&B)	Freshman cohort from two Wisconsin high schools	High School and Beyond (HS&B)	Cohort of Black children from Chicago	1990 High School Effectiveness Study (HSES)
Number of observations	12,700	3,355	651	4450 individuals, 177 schools	1,242	7642 individuals, 247 schools
Data collection	One sweep, 1979	Two sweeps, 1980 and 1982	Create histories back t o elementary school and forward to expected graduation years	Two sweeps, 1980 and 1982	Data collected in 1966, 1975 and 1982	Data collected in 1990 and 1992
Demographic	Ethnicity, gender	Ethnicity, gender	Gender	Ethnicity, gender	Gender	Ethnicity, gender
Individual (early childhood and elementary)	None	None	Attendance, ability, achievement, grades, discipline record, special education referrals	Early academic problems	School behavior and performance	Retention in grades 1-8
Individual (middle and high school)	Ability proxy, educational and professional aspirations, initiative, marital/parenthood status	Ability proxy, grades, self-esteem, hours worked, truancy and tardiness, locus of control, discipline record, educational aspirations	Attendance, ability, achievement, grades, discipline record	Ability proxy, grades, self-esteem, hours worked, truancy and tardiness, locus of control, discipline record, educational aspirations	Standardized tests of achievement at age 12-13, educational aspirations	Took remedial math or English in grades 9 or 10.
Family	Household composition, SES, cultural index.	SES	Household composition, SES, family mobiliy	SES	SES, household composition, mothers aspirations, parent child interaction regarding school, PTA involvement, rules	SES, household composition
Engagement	None	None	None	None	None after grade 1	None
Peer group	Best friend's aspirations	None	None	None	None	None
School	None	Student ratings of teachers and school discipline, school climate	None	Mean characteristics of schools, differences in courses of study, student ratings of teachers and school discipline, school climate, school size	Student perceptions of teachers	Structural factors, resources, climate and discipline, assessments of teachers, average attendance, mean demographic charactertistics
Community	Urban/rural, local unemployment	None	None	None	None	None

2.1 Individual Effects

The literature linking individual characteristics to dropping out of school is well developed. Several common findings have emerged. Youth are more likely to drop out if they:

- are doing poorly academically, especially those in lower academic streams;
- have lower levels of self-esteem and a poor sense of control over their lives;
- are less interested in school and experience feelings of alienation;
- work excessive hours in part-time employment; and/ or
- are frequently truant, and generally have a poor attitude towards school.

Generally, males are more likely to dropout than females. In the US, African- and Hispanic-American are less likely to graduate than whites, and in Canada, Aboriginal youth are less likely to graduate than non-Aboriginal youth.

2.1.1 Early effects

The fundamental tenet of a "life course model" is that early experiences and events have an on-going and cumulative effect on outcomes. The process of becoming a young adult who strives to succeed at school and makes a successful transition to the labour market begins at birth. Most longitudinal studies of dropping out are unable to examine early effects in any meaningful way, yet from the perspective of designing effective interventions, this is an area in crucial need of further understanding. Given the importance of early effects, findings from studies that are able to include early school and childhood effects are given special attention.

Ensminger and Slusarcick (1992) argued that collecting information at a young age is crucial, because many early childhood experiences have a significant impact on whether a child will leave school before graduation. They also noted, as has Rumberger (1995), that a substantial portion of dropouts leave school prior to even entering secondary school. The researchers examined the developmental pathways towards high school graduation for a cohort of 1242 Black first-graders from an urban community who

were at-risk of dropping out. They found that students in the first grade who achieved A's or B's, as opposed to C' s and D's, were much more likely to graduate from high school. This effect was more pronounced for males than for females. Also, the effect of achieving high grades was stronger for mathematics than for the language arts. Resilient children – those who were identified as living in poverty, but had achieved A's or B's in first grade – tended to have very good chances of graduation. These individuals were thought of as "especially competent." In contrast, students living in poverty with poor first-grade academic results had very low graduation rates. Children's behaviour during the first grade was also an important predictive factor: those considered as aggressive during the first grade were less likely to graduate 12 years later. However, children considered by the teacher to be shy or under-achieving fared relatively well. The finding that aggressive behaviour as early as first grade is a key predictor of early school leaving is confirmed by Alexander, Entwisle, and Horsey (1997).

Assessments during the first grade of the extent to which parents read to their children and children confided in their parents regarding school did not have a significant impact on graduation rates. However, young people who did confide in their parents at age 16, and whose parents were involved in school organizations, were more likely to graduate from high school. Also, adolescents who reported strict discipline in the household were significantly more likely to graduate from high school, and at least for females, the effect of strict discipline tended to mediate the effect of earlier low levels of achievement. The hopes and expectations of mothers when their child was in the first grade was not a significant predictor of dropping out, but later, when their children were adolescents, aspirations were negatively related to dropping out. Females were 1.26 times more likely to graduate than males. The authors concluded:

> The process leading to school dropout in this population were established early in the school career. Both males and females, but especially males, were handicapped by starting school with poor grades. In addition, maternal education, family poverty and aggressive behaviour during first grade related to graduation 12 years later, either directly or indirectly. (p. 110)

A number of other studies begin tracking young people in junior high school to examine how these experiences influence their future academic performance and the likelihood they will leave school before graduation. For example, Barrington and Hendricks (1989) conducted a longitudinal study of 651 high school students to compare dropouts with those who had graduated on schedule. They tracked a 1981

cohort of high school freshmen through to the point at which they should have graduated using student records to compile a detailed database of academic achievement, attendance and disciplinary problems as far back as entry to elementary school. Their analysis used one-way ANOVAs and graphical techniques. Despite the relatively limited power of these techniques, their findings revealed several noteworthy points. First, dropouts began to exhibit higher rates of absence from school as early as grade one, with the differential increasing as the cohort passed through each successive grade. In addition, indicators of intelligence and achievement as early as third grade were predictive of which children would eventually drop out. Children with a low achievement-to-intelligence ratio – an indicator of *under*-achievement – were more likely to drop out. Finally, they found that a tabulation of teachers' negative comments differentiated graduates from dropouts. They attribute some of the cause of dropping out to parents attitudes towards schooling, although this finding should be treated as speculative because parents were not surveyed. Their conclusion was that graduates can be distinguished from dropouts very early in their school careers. Discipline problems and high levels of absenteeism are two of the most important early indicators.

Barrington and Hendricks's (1989) findings are consistent with those of Cairns, Cairns and Neckerman (1989), who reported that high levels of aggressiveness and low levels of academic performance among seventh grade children were strongly associated with whether they dropped out of school in the future. They also noted that the combined effect of grade retention and early school aggression was a particularly potent predictor of dropping out.

2.1.2 Engagement

The term *engagement* is used in the literature to refer to the extent to which students participate in academic and non-academic school activities, and identify with and value schooling outcomes. Its definition usually comprises a behaviourial component pertaining to participation in school activities (e.g., Finn, 1993, 1997; Wehlage, Rutter, Smith, Lesko, and Fernandez, 1989), and a psychological component pertaining to students' identification with school and acceptance of school values (Finn, 1993, Finn and Rock, 1997; Goodenow, 1993; Goodenow and Grady, 1993; Voelkl, 1995, 1996, 1997; Wehlage *et al.*, 1989). The participation component is usually operationalized by factors such as school and class attendance, being prepared for class, completing homework, attending to lessons, and

being involved in extra-curricular sports or hobby clubs. The psychological component can entail students' sense of belonging, their social ties and bonds, their relationships with teachers, whether they feel safe and secure at school, and the extent to which they value school success. We feel it should be considered separately from *motivation*, the desire to succeed in particular academic pursuits. For example, Newmann, Wehlage and Lamborn (1992) defined engagement in academic work as "...the student's psychological investment in and effort directed toward learning, understanding or mastering the knowledge, skill or crafts that academic work is intended to promote."

In many respects, at least operationally, engagement is a close cousin of "social capital," which embodies features of social organisation, particularly the networks and norms that facilitate co-ordination and co-operation for mutual benefit (Coleman, 1990; Putnam, 1993). Coleman (1988), initially coined the term and suggested that high levels of social capital may make an important contribution encouraging young people to remain in school and partially off-setting some of the SES disadvantages. However, social capital is increasingly being used as a macro phenomena. Woolcock (2000) makes a crucial distinction between *bonding* social capital (the relations among family members, close friends, and neighbours), *bridging* social capital (social ties with more distant friends, associates, and colleagues), and *linking* social capital (alliances with those in power that enable one to leverage resources, ideas, and information). Engagement, at least as it is used in the literature, is a micro phenomena, and it is safe to say that it is multidimensional. Like the concept of "social capital," research using this concept is in its early stages, and researchers have not settled on a definition. The most important components seem to be *participation,* especially in social clubs and groups (consistent with Coleman and Putnam), *sense of belonging* (Woolcock's bonding social capital), *relations with teachers* (Woolcock's linking social capital), and *valuing school success.*

Given the difficulty with defining engagement, it is not surprising that accurately measuring it is a key problem for social scientists seeking to understand its relationship with schooling outcomes such as academic achievement, behaviour, and staying on at school. One of the principal issues is: "Who should be the informant – the child, the parent, or the teacher?" The answer to this question needs to be considered in relation to the child' s age and the dimension of engagement being considered. Measures of participation or relations with teachers might be accomplished with a third-party informant, but as

soon as the child is old enough, one would want to begin capturing data on sense of belonging and valuing school success. But even at this age, having measures from a teacher or parent would be a useful supplement. Swift and Spivack (1969) asked teachers to evaluate more than 1500 12-19 year-old students on 45 different behaviour measures. A factor analysis revealed that several of the measures related to engagement were significantly related to academic performance.

If we can set aside the issues of definition and measurement (we will return to them later), we can discuss where engagement fits in a life-course model explaining dropping out. Finn (1989) describes two models that seek to explain the process of "withdrawing from school," which he viewed as the converse of engagement.

The *frustration-esteem model* identifies school failure as the starting point in a cycle that may culminate in the individual rejecting or being rejected by the school. The young person has poor school performance, which leads to low self-esteem, and eventually to a rejection of the system responsible for his or her poor performance. The blame for poor performance is commonly attributed to the school's failure to provide adequate instruction, or sufficient emotional and environmental support. Bernstein and Rulo (1976) used this model to explain the consequences of undiagnosed learning problems: as a child becomes increasingly frustrated and self-conscious about school failure, he or she exhibits deviant behaviour, which increases with age as long as the learning problem goes undiagnosed. They argued that as more time is spent controlling undesired behaviour, less time is spent on learning and correcting the learning disability. This leads to a cycle whereby the student falls farther and farther behind, becoming increasingly frustrated and embarrassed, until he or she gets either suspended or expelled from school, and ultimately drops out.

Bloom (1976) suggests that early success and encouragement can provide some form of immunization from future difficulties in school. However he notes:

> At the other extreme are the bottom third of students who have been given consistent evidence of their inadequacy…over a period of five to ten years. Such students rarely secure any positive reinforcement in the classroom… from teachers or parents. We would expect such students to be infected with emotional difficulties [and to] exhibit symptoms of acute distress and alienation from the world of school and adults.

The *participation-identification model* focuses on student's involvement in school, incorporating both behavioural and emotional elements. It posits that increased participation in school and classroom activities results in young people deriving a significant part of their identity from the school, and therefore they are less inclined to leave. A key part of withdrawal is disengagement, and if students remain engaged, they are less likely to dropout. Elements of this model covering the age range from early childhood to secondary school have been evident in the literature since the 1960s.

A longitudinal controlled study of the effects of intensive pre-schooling, which followed children until age 19, found that children which formed "strong social bonds" to institutions were less likely to engage delinquent behaviour (Burreta-Clement, Schweinhart, Barnett, Epstien, and Weikart, 1984). A retrospective study that compared dropouts with a matched sample of graduates found that dropouts participated in fewer school activities throughout their academic career, and were less communicative with their families. Dropouts were usually unable to discuss personal matters with their parents, and often felt misunderstood (Cervantes, 1966).

Hirschi (1969) collected data from 1200 students entering junior and senior high school to examine attitudes towards school, parents and peers, and how these related to self-reported levels of delinquency. Attachment to parents was determined with questions about whether they confided their thoughts and feelings with their parents, and whether their parents were aware of what they were doing when they were away from home. Attachment to school was assessed by asking students whether they liked school, and cared about what the teacher thought of them. Hirschi found that both of these measures of attachment had an inverse relationship with delinquency.

Radwanski (1987) concludes that rejection of the individual by the education system is a cumulative process. He notes that the majority of dropouts have positive recollections of their elementary-school years, but a minority could say the same about high school. He argues that students from low SES backgrounds have less educational experience and soon find themselves in a non-academic stream that offers them little opportunity to end the cycle of inequality. They become frustrated and they drop out.

LeCompte and Dworkin (1991) describe a similar process whereby students resign from school when they see that it will not provide them with the tools necessary for them to achieve a higher social strata.

In effect, this kind of streaming being concentrated on individuals from low SES backgrounds has the net effect of perpetuating social inequality. Children from good backgrounds end up in academic streams and children from poor backgrounds end up in vocational streams, with little view to education beyond high school.

While there is limited statistical evidence demonstrating the relationship between engagement and early school leaving – the constructs of engagement are still under development - there is little doubt that it has a strong effect. We believe that dropping out represents a symptom of disengagement that is not fully understood. Developing effective metrics of engagement must be a key focus in future research.

2.2 Family Effects

There is a sizeable body of evidence suggesting that the cumulative effects of family circumstances have a profound effect on educational attainment. Studies from the U.S. and the U.K. have consistently found that factors pertaining to the child's family circumstances are significantly related to dropping out of school. These include: socioeconomic status (SES), with those coming from poor backgrounds being more likely to drop out; family structure, with those coming from large and single-parent families being more likely to drop out and parents' employment status, with those living with parents who are unemployed being more likely to drop out. This literature has generally shown that the socioeconomic "gradients" – that is, the relationship between dropping out and SES – are established early in the life course, vary with age of the child, but persist into secondary school.

Entwistle and Hayduk (1988) found that later school performance was related to early influences of parents and teachers, even when controlling for cognitive ability. Specifically, they found that parents' estimates of their children's academic ability in the third grade were related to children's academic outcomes four and nine years later. Their findings suggest that patterns of academic performance are established early and that the social context within the family and the classroom are important in the establishment and maintenance of these patterns. Mare (1980) showed that for cohorts of white males, family structure and SES were important for early progress in school, but became less relevant as individuals moved through the school system, as "outside" influences begin to have a stronger effect. Rumberger's (1983) early research based on the 1982 National Longitudinal Survey (NLS) of Youth

Labor Market Experiences found that youth from poorer backgrounds were more likely to drop out of school and he noted that the relative magnitude of various effects depended on race and gender.

Research in the U.K. based on the Youth Cohort Study has focused on whether youth stop attending school when they first become eligible to leave at age 16. Dolton, Hutton, Makepeace and Audas (1999) found that early school leaving is associated with parents' social class and family structure, even after controlling for academic performance up to that stage. Audas (1994) also found a significant relationship between early school leaving and SES, using data from the Canadian Labour Market Activity Survey (LMAS). He found that individuals coming from families where the head of the household was unemployed were significantly more likely to leave school without graduating. However, being in receipt of unemployment benefits tended to mediate this effect, suggesting economic hardship may influence the decision to drop out.

This research complements the U.S. literature in two important respects. One might expect that all factors associated with SES, such as access to intellectual material (e.g. books, newspapers and computers), would play themselves out through measures of academic achievement. This implies that the likelihood of a child dropping out, *given his or her achievement up to the age of 16*, would not be related to SES – the SES effect would be captured in the achievement at 16 indicator. However, this is not the case, at least in the U.K., which suggests that there is another piece to the puzzle. However, low SES may have a more tangible effect on individuals decision to leave school, with it proving to be an economic necessity. We can think of these as pull factors, drawing "discouraged workers" into the labour market (Raffe and Willms, 1989). Audas's (1994) found that dropping out was negatively associated with receipt of UI benefits (although positively associated with household head's labour force status) suggesting that this may also be the case in Canada. Individuals coming from disadvantaged families may need to work to support their parents and siblings and these conditions may pull the young person into the labour market. But it may also be due to differences associated with students' aspirations. In either case, the findings have a close link with policy since the SES/dropout relationship remains significant despite the inclusion of a variety of other intermediary factors such as achievement and attitudes towards school. Although the research has documented the importance of family SES to

dropping out, we do not know much about the functional form of the gradient, or the factors that mediate the gradient at different stages of the life course.

The recent North American research has emphasized the importance of parenting styles as a mediator of socioeconomic gradients. Rumberger, Ghatak, Poulos, Ritter and Dornbusch (1990) stressed that parental involvement in their children's schooling is the crucial factor that distinguishes low achievers who remain in school from those who drop out. They also note that children are more likely to drop out if parents employ a permissive parenting style - giving less guidance in important decisions, or an authoritarian style - reacting harshly to their children's poor school performance and applying severe sanctions. More generally, in a comprehensive review of the literature linking parenting to achievement, Hess and Holloway (1985) identified five key processes: verbal interaction between mothers and children, positive affective relationships between parents and children, parents' beliefs and attributions about their children, discipline and control strategies, and parental expectations.

2.3 Peer Effects

The role of peer networks has received relatively little attention in the statistical work that has been conducted examining delinquency and dropping out. This is largely due to the difficulty of meaningfully quantifying these aspects of a young person's life. This is ironic since, at least anecdotally, the reason many parents give for undesired outcomes in their children is that he or she "got in with the wrong crowd." Adolescents tend to derive a great deal of their sense of self worth from their friends, and to a large extent, they adjust their behaviour to "fit in" with their social network.

Ellenbogen and Chamberland (1997) examine the peer networks of at-risk youths and describe how their networks compare to those of youth deemed to be of a low risk of dropping out of school. They identify three established trends: First, actual dropouts and future dropouts have more friends who have dropped out. Second, future dropouts tend to be rejected by their school peers. Finally, at-risk individuals tend to lack integration into their school's social network.

An important interaction, which has not been fully understood, is the role that peer groups have on engagement. Kelly (1993) identifies three ways that peer groups are involved with the disengagement process. She argues the mechanisms through which this can occur are conflicts with other students

leading to expulsion; disassociative feelings with school peers, motivating a quiet withdrawal from that environment; and finally, relationship and pregnancy domains taking over school in the young person's set of priorities.

Ellenbogen and Chamberlain seek to examine how peer networks differ between at-risk and not at-risk young people. They surveyed 191 students aged 14-16 in a suburban Montreal school using a method devised by Lavoie (1983) to identify which young people were "at-risk," They use Claes and Simard's (1992) inner and outer friendship measures which are based on Blyth's (1982) suggested methodology for mapping social networks. This is comprised of the individual's friendship network in school and elsewhere (by writing the names of all their friends and where the individual usually meets them) and the work status of all their friends, determining if each friend has a full-time or part-time job; and if they are in school.

In addition they used a peer-report technique in which subjects identify three classmates with whom they would most like to participate in an activity and three with whom they would least like to participate in an activity. Students were considered rejected by their peers if the number of negative votes received was one standard deviation higher than the mean for their class. Generally, rejected youth had six or more negative votes and two or fewer positive votes. Ellenbogen and Chamberland found:

- Dropout friends became increasingly present in the friendship networks of at-risk youth.
- At-risk youths were more likely to have at least one dropout friend.
- By the end of the school year (these were 9th graders) at-risk youths were more likely to have dropout friends in their inner-friendship circle.
- At-risk youth were found to have marginally more close friends who had graduated from high school.
- At-risk youth were more likely to have at least one working friend.
- In relative terms, at-risk youths had 13% fewer friends.
- No significant between-group (at-risk and not at-risk) differences were found in the proportion of neighbourhood friends and friends from other vicinities.

- There were no differences in the environments where their close friends met.
- At-risk students tended to have fewer same-sex friends.
- At-risk students were more likely to be rejected by their peers, but only when surveyed at the end of the 9th grade.

Ellenbogen and Chamberland also examined the friendship patterns of individuals who were rejected by their peers at school. They found that although rejected students had fewer school friends, the size of their friendships networks were similar to that of their non-rejected peers. However, this varied by gender: rejected females tended to have fewer same-sex friendships than males, and the overall number of friendships was declining, whereas the rejected males had more same-sex friendships, and their social circle was enlarging. Parker and Asher (1987) refer to these as "six hour (the length of the school day) unpopular children" who are socially accepted in one environment, although not another.

One of the main themes of this review is that there is a wide range of factors influencing the lives of young people and impacting on the propensity to drop out of school. One of the most comprehensive studies attempting to integrate data from a wide variety of sources and trying to capture multiple facets of adolescents' lives is Janosz, LeBlanc, Boulerice and Tremblay (1997). They used two longitudinal databases to examine the most powerful predictors of school-leaving and to assess their stability over time. The first set of data was collected in 1974 and contained 791 white French-speaking children aged 12-16 randomly sampled from the Montreal area. The second set was collected in 1985, and also contained 791 white French-speaking children in Montreal, but the sample was targeted at children from moderate and low SES families.

The researchers included a variety of measures relating to the individuals' family situations and processes that govern their relationship in the family and school. In addition, they sought information on peer relationships, leisure activities, beliefs in conventional norms and frequency of specific behaviour in the previous 12 months. A variety of measures describing their school experience were collected, including grades, grade retention, stress, disciplinary sanctions, involvement in school and commitment to schooling. Several psychometric measures were also incorporated into the survey.

The particularly interesting aspects of the study are the inclusion of family process variables, peer networks, and young people's use of leisure time. Family process variables included measures of rules, communication, acceptance and identification in addition to measures of marital discord and parental alcohol consumption. The peer networks are captured by the number of friends, the extent to which young people are involved and identify with their friends, whether or not an individual is the leader in his or her circle of friends, and the extent to which the child's friends are involved in delinquent behaviour. Leisure time was measured by determining the individuals' allowance, the extent to which they were involved in active and passive activities, loitering, part-time employment, and religious practices. They also assessed the degree to which they respected authorities.

They found many factors predictive of dropping out. Grade retention was the most powerful explanatory variable. They also found that dropouts were less likely to respect authorities, and were more likely to participate in passive activities. After taking these factors into account, family and school factors were not strongly predictive of dropping out, but the researchers acknowledged that their study did not directly examine the way schools influence dropping out or adequately capture data pertaining to early childhood.

Peer networks are one of the most important elements of socialisation and they have a profound effect on the lives of young people. What is not sufficiently well understood is how the formation of peer networks is the consequence of, or the precursor of, other social outcomes. Future research on school-leaving needs to explain these relationships.

2.4 School Effects

While a lot is known regarding individual background and academic performance and their effects on the process of dropping out of school, considerably less is known about how schools influence this outcome. School effects are particularly important since they are the principal mechanism through which governments can target policies to curb dropping out, teen pregnancy and a variety of other undesirable outcomes.

Wehlage and Rutter (1986) argue that educators have little control over dropouts' background characteristics, and therefore they focused on characteristics of the school experience that may contribute to dropping out:

> Implicit in much research on school dropouts is the assumption that a better understanding of the characteristics of dropouts will permit educators to develop polices and provide practices that will reduce the number of adolescents who fail to graduate. The intent is noble, but the results are negligible because the focus on school, family and personal characteristics does not carry any obvious implications for shaping school policy and practice. Moreover, if the research on dropouts continues to focus on the relatively fixed attributes of students, the effect of such research may well give schools an excuse for their lack of success with the dropout.

They argued that new research might better be directed toward understanding the "institutional characteristics" of schools – the policies and practices that have an impact on the school' s holding power over individuals – and how these factors affect at-risk youth. They used the *High School and Beyond* (HSandB) data, which surveys over 30,000 young people in 1,105 US schools, to compare the experiences of students who dropped out, those who graduated but did not immediately pursue further formal education, and those who were college bound. They found that youth who had dropped out perceived teachers to be less interested in them, and viewed school discipline as ineffective and inequitably applied. Those destined to leave school early had more disciplinary problems, and were generally dissatisfied with how their education was going.

Wehlage and Rutter also make a very interesting observation. When the first wave of data was collected in 1980, very few individuals saw themselves dropping out of school. In fact, since most believed they would finish high school, a large proportion of those who eventually dropped out anticipated participating in post-secondary education. This suggests that when young people start high school, they intend to finish, but something happens along the way that results in them leaving. The authors conjecture that it is a lack of attention from teachers, and their perception that school discipline is ineffective and unfair. They provide anecdotal evidence that "focused" schools, such as magnet schools in the performing arts, are successful because their offerings are more relevant to what young people want to do, and build on their strengths and interests.

Other researchers have stressed the organisational features of schools. Purkey and Smith's (1983) review of "effective" schools found that organizational factors, including "clear school goals," "rigorous

academic standards," "order and discipline," "homework," "clear leadership by the school principal," "teacher participation in decision-making," "parental support and cooperation" and "high expectations for students" were positively related to school performance. This is, in turn, related to higher likelihood of staying in school. Chubb and Moe (1990), using the High School and Beyond (HSandB) data, found that effective schools tended to have a high degree of autonomy and freedom from bureaucratic controls. Presumably this provides the schools freedom to target specific programs for young people who are vulnerable.

Pittman and Haughwout (1987) examined the effects of school size on dropping out. They suggest that there are two competing effects that school size may have on dropping out. Larger schools can offer a greater range of classes and have the resources to provide more extra-curricular activities, which should enable them to better meet diverse student demands. However, prior research has suggested that while larger schools may have more "cutting edge" programs, participation tends to be concentrated among relatively few individuals. A higher proportion of students participate in extra curricular activities in smaller schools. Pittman and Haughwout's study of 744 schools found that school size has an influence on the dropout rate, manifested through the school social environment. They note: "Larger student bodies tend to produce a less positive social environment, less social integration, and less identity with the school…The level of student participation and the severity of problems at the school are the major components in the projected effect of the social environment on dropout rate." They found that the effects of diversity in programs and course offerings, although positive, were relatively small.

McDill, Natriello and Pallas (1985) argued two broad factors tended to characterize schools with high dropout rates. The first they called "urban social disorganization": large schools in big cities that contain a significant proportion of students from an ethnic minority background. These schools tend to be located in areas of high unemployment, crime, poverty and single parent families. This suggests that, on average, an at-risk young person will be more apt to dropout if they experience urban social disorganization, than they would be otherwise. The second broad factor involved the administration of the school itself. Those schools with high dropout rates are characterized as having low levels of cooperation between teachers and administrators, teachers who maintained control over instructional

objectives, perceptions by students that discipline was unclear and unfair and a high proportion of students who do not follow normal social conventions.

The issue of school quality has received little attention in the literature, largely because it is difficult to separate quality of the school from the quality of students and compositional effects of concentrating "high ability" and "low ability" children in separate institutions. Dolton, Hutton, Makepeace and Audas (1999) found that students in selective and fee-paying schools in the U.K. were more likely to continue in education at age 16, than those who attended comprehensive (state-funded) schools, even when accounting for grades and parents' social class. Earlier work by Willms (1986) and McPherson and Willms (1986) on school attainment in Scottish secondary schools suggests that the social class composition of the school has a strong bearing on student's academic attainment: when low SES students are concentrated in particular schools, they are more likely to leave school early. The complement of this is that if children from poor backgrounds gain access to better schools and associate with peers who are less likely to dropout, they are also less likely to leave school early.

One of the principal problems in studying dropping out is it has been difficult to separate individual and school effects. However, recent advances in hierarchical or multi-level models have allowed for a much more accurate estimation of school effects. Bryk and Thum (1989) used a multilevel approach to differentiate individual from compositional effects of attending a school that has a high level of some particular demographic trait that is associated with dropping out of school, such as low SES or a large proportion of the school population being ethnic minorities. The multilevel approach allows for individual and compositional effects to be disentangled, such that better estimates of the aggregate effects of demographic characteristics can be computed. They also extended their analysis to examine absenteeism from school.

They used the 1980 sophomore cohort of the HSandB data. At the individual level they included race, gender, and social class as control variables, in addition to earlier academic and disciplinary problems, and absenteeism. They also incorporated a variety of school-level measures, including principals' and students' perceptions of teacher commitment to the school and involvement with students; measures of the academic and disciplinary climate; measures of the diversity and level of course offerings; and compositional variables describing the school's demographic composition. Their findings suggest that

school compositional factors are important, implying that a redistribution of children to schools with more favorable demographic circumstances (i.e. more middle-class children) would on average have a positive influence on young people coming from schools with less favorable demographic circumstances.

Rumberger (1995) also used a multi-level model to examine dropping out of middle school, using data for approximately 25,000 middle school students in 1,100 schools collected as part of the National Education Longitudinal Survey of 1988 (NELS:88). Individuals were surveyed in 1988 and again in 1990 when most of the original cohort were expected to have proceeded to the 10th grade. Rumberger classified the variables used to predict school-leaving into several categories, including demographic characteristics, family background and parental participation variables, academic background and student attitudinal measures. He also included a number of school-level indicators, such as student composition, school size, student-teacher ratio, whether the school was urban or rural, and whether teachers in the school were covered by a collective bargaining agreement. He also included measures of school organization and climate, including measures of teacher quality, mean hours of homework reported by students, mean level of parental participation, the percentage of students who felt safe at school, the proportion of students who believed that discipline was fair, and the proportion of students in algebra or advanced math. His findings support most of the individual and family effects established in the literature. He had particularly strong findings showing that family academic support has a strong positive relationship with staying in school. In addition, he found that individuals coming from schools with demonstrated disciplinary problems are more likely to drop out of school. He also notes that the most powerful predictor of school leaving is being held back in the previous grade.

Rumberger and Thomas (2000) extended this work using data from the 1990 High School Effectiveness Survey (HSES) which is a representative sample of 10th graders from 247 high schools. The variables included and methodological approach is much the same as Rumberger's (1995) study, with the important distinction that the individuals were now being followed through high school rather than middle school. They also extended this study to examine levels of school turnover, arguing that better schools have low turnover rates, making it a valid performance outcome to evaluate. The study had three main findings: First, there was greater variation in turnover rates than there was in dropout rates, with the incidence of turning over being considerably higher than was the incidence of dropping out. Second,

individual propensities to turnover and drop out were highly affected by school compositional factors. An average student is more likely to drop out or turnover from a school that has high levels of dropping out or turning over than is an average student from a school that has more moderate levels of these two outcomes. Finally, the effect of schools on propensities to drop out is powerful. Individual and family effects explain approximately half of the variation in dropout behaviour, with the remainder, the authors suggest, relating to the schools themselves. They also noted that school resources, school structure and school processes affect the dropout rate, and in particular, student-teacher ratio, school control, size and average daily attendance play an important role.

There have not been any large-scale Canadian studies examining the effects of school factors on dropping out. However, a small study by Lawton, Leithwood, Batcher, Donaldson and Stewart (1988) of 58 schools in six Ontario school districts yielded findings consistent with the American literature. They found that a positive image of the school in the community, a strong academic curriculum, high expectations of teachers for all students, high levels of collaboration between teachers, and time spent with students outside of class were significantly related to a lower dropout rate for the school.

2.5 Community Effects

A topic which has received limited attention in the literature is the influence communities have on dropping out of school. Clearly, community factors are highly related to factors pertaining to family background, schools and peer networks, and therefore identifying neighbourhood effects, *per se*, is difficult. However, developing an understanding of how communities interact with other classes of variables, and discerning their independent effects on dropping out, is crucial in developing a more complete understanding of the school-leaving process.

2.5.1 Epidemic and contagion models

Crane (1991) used an "epidemic model," which is a subset of contagion theory (see Jencks and Mayer, 1990) to show that the hypothesized relationship between high school dropouts and socio-economic status is non-linear, with those from the poorest neighbourhoods being disproportionately more likely to drop out. Crane took the analogy of epidemics and applied this to communities, proposing "that ghettos are neighbourhoods that have experienced epidemics of social problems." At the core of epidemic

theory is that social problems are contagious and are spread through peer influence, such that children living in neighbourhoods with a high concentration of social problems will tend to have networks of friends who are dropouts or on a trajectory towards dropping out. He argued that residents' risk of developing social problems and their susceptibility to peer influence were two fundamental conditions determining a community's susceptibility to epidemics. He hypothesised:

> The relationships between neighbourhood quality and the incidence of particular social problems should be non-linear. Social problems should increase as neighbourhood quality declines, but not at a constant rate. Somewhere near the bottom of the distribution of neighbourhood quality, there should be a jump in the rate of increase. This is because the prevalence of problems should be much higher in those neighbourhoods that have experienced an epidemic than in those that have not. *Thus, the epidemic theory implies that there are very strong neighbourhood effects at at least one point near the bottom of the distribution of neighbourhood quality.* (Emphasis is ours.)

Crane's empirical examination of these issues used the Public Use Microdata Samples (PUMS) from 1970, which has 55 community indices attached to each individual's record. He noted that data comprised of a single cross-section has limitations; but the number of individuals in the database allowed for a meaningful analysis of small sub-groups, especially those in urban ghettos. His proxy for neighbourhood quality was the proportion of individuals in an area with "high status" jobs (i.e., Managerial or Professional occupations). High status jobs were thought to be an important indicator of neighbourhood quality, since they provide important role models for young people.

In estimating the likelihood of dropping out, he controlled for individual and family effects using family income, parents' educational status, family head's occupational status, household structure, family size, urban origin, gender, race, place size, region and residential mobility. Notably absent from the models were measures of ability, achievement, attitudes towards school, and truancy. He found that the pattern of neighbourhood effects on dropping out supported epidemic theory: there was a linear increase in predicted probabilities associated with neighbourhood quality, until the proportion of individuals in the neighbourhood holding high status jobs falls below 5%. At that point, there was a marked "spike" upwards, indicating a disproportionate concentration of dropping out in the worst neighbourhoods. In fact his calculations suggested that the effect of neighbourhood quality measures on dropping out in the very worst communities is more than 50 times greater than the effect for individuals in middle class areas.

As the studies explicitly examining neighbourhood effects on dropping out are limited, it is useful to review studies looking at outcomes related to dropping out. A number of studies have looked at the role of communities on the educational attainment and probability of teen pregnancy. Datcher (1982) used the Panel Study of Income Dynamics (PSID) to study urban males aged 13-22. She used zip codes to create geographic boundaries (or neighbourhoods) to examine the impact that area-averaged income had on educational attainment. Controlling for parents' educational attainment and income, family size, region, community size, age and the head of household's educational aspirations for his or her children, she found that a 10 percent increase in neighbourhood income was associated with and increase in educational attainment of one tenth of a year.

Corcoran, Gordon, Laren, and Solon (1987) also used the PSID to examine individuals between 10 and 17 to determine the effects of four different zip-code characteristics: median income, percentage of female headed-homes, male unemployment rate, percentage of people receiving public assistance on individual educational attainment. Control variables were race, region, city size, religion, family structure, family income, welfare receipt, the educational attainment and hours worked of the head of the household and spouse (if present). For males, a two standard deviation increase in the proportion of female-headed households in the zip-code area (approximately an 8% increase) lowered expected educational attainment by one quarter of a year. A two standard deviation increase in the welfare-receipt rate in the zip-code area (approximately a 10% increase) reduced expected educational attainment by half a year. Neighbourhood unemployment and income levels did not have a significant effect. For females, a two standard deviation increase in the zip code male unemployment rate decreased expected educational attainment by half a year and a two standard deviation increase in the percentage of families headed by a female reduced expected schooling by one quarter of a year. In addition, a two standard deviation increase in the welfare receipt rate lowered attainment by slightly less than half a year. Median neighbourhood income did not have a significant effect.

Wagenaar (1987) examined the relationship between schools and communities. He observed that well-off families generally live in better neighbourhoods and typically there are more resources available for education in these areas. This equates to better facilities and teaching resources as well as more specialized services (music programs, better athletic facilities, etc.). These better equipped schools in

good neighbourhoods are going to have much more success in attracting the most motivated and skilled teachers, which in turn could lead to lower levels of dropping out. This has natural policy implications, suggesting that if funding could be targeted to improve facilities in poor neighbourhoods, and incentives were put in place to attract the best teachers to poor schools, there may be a significant move towards improving equity in terms of the propensity to drop out of school.

2.5.2 The influence of local labour market conditions

A number of studies have examined the role of labour market conditions on the decision to leave school. Most dropouts, if not leaving school to go directly into work, at least engage in search soon after they leave. Economic theory is ambiguous in terms of the expected relationship between dropping out and the relative strength of the labour market. One theory suggests that in times of high unemployment, the potential dropout would be more inclined to remain in school and add to their human capital, rather than quit school and endure a spell of unemployment. Quite simply, if there is an abundance of employment opportunities available to the potential dropouts, then they are more likely to enter the labour market. An alternative theory suggests that if labour market conditions are poor, it is less likely that educational achievement will bring them a significant return. There is little difference between being an unemployed high school graduate and being an unemployed dropout.

Raffe and Willms (1989) used the term "discouraged worker" to describe the latter effect. Their research employed a multilevel approach to examine variation in the school-leaving rates of Scottish secondary schools. They found generally that pupils were less likely to stay on at school in areas where there was abundant employment, but their results are particularly compelling in that the rate of early school-leaving in some schools, especially those in the Highlands, was considerably higher for boys than for girls, and the *differences* in the local employment rates for male and female youth was related to *differences* in the male and female school-leaving rates. Rice (1987) also finds evidence that poor labour market conditions, *ceteris paribus*, have a positive effect on the probability of staying on at school. More recent research by Dolton, Hutton, Makepeace and Audas (1999), which examined the role of labour market conditions on the decision to leave school by including local adult unemployment rates and regional youth unemployment rates, support the notion of a discouraged worker effect. Other evidence is mixed: Audas (1994) and Micklewright, Pearson and Smith (1990) could not find a

significant relationship between unemployment rates and the probability of dropping out in Canada and the UK, respectively, whereas Rumberger (1983) found lower unemployment rates associated with an increased propensity to drop out of school among ethnic minorities.

A problem in incorporating labour market conditions is getting data that forms a reasonable composite of the opportunities (or lack thereof) that young people face. As such, labour market variables need to closely proxy the conditions in the communities where young people could reasonably expect to work. Another problem is which factors best "define" the labour market. A number of factors have been used, including adult unemployment rates, participation rates, market and minimum wage rates, youth unemployment rates, quality and status of occupations, job openings, etc. An important question is: which of these factors have the most influence on a young person's decision to remain in or to leave school. Statistical models of dropping out should incorporate as many labour market factors as possible to weigh the relative influence of each.

3. A "Life-Course" Model

There is an impressive volume of research examining the propensity of young people to drop out. Most of this research has focused on the characteristics of youth who drop out, particularly their family background, academic achievement, and behaviour (e.g. aggression, poor attitude towards school). It has also pointed to the impact of some key school experiences, such as whether a child had ever repeated a grade. The dominant research approach has been some form of multiple regression, typically with the outcome variable being a dichotomous variable denoting graduate *versus* dropout. The link from this research to social policy seems rather weak, as many of the factors that profile a typical dropout seem to be intractable to interventions or educational policy. Suggesting that we may be able to identify who is most at-risk of leaving, but evidence of effective intervention strategies is limited.

3.1 Themes of a Life Course Model

An overarching theme in this model is that the antecedents of academic success begin when the child is born. However, all too often dropping out is viewed as an early failure when there are a number of important intermediary mileposts that provide a strong indication of future success. The evidence cited in the previous section indicates a clear link between early childhood experiences and successful graduation from secondary school. As such, the process of modeling school leaving needs to begin when the individual is born. Successful completion of secondary school and transition to post-secondary education or employment is a long process, and there are a number of intermediary benchmarks that can be monitored to determine if the individual is on course for timely graduation, or alternatively on a course to leave school early, which can be associated with several other undesirable outcomes.

Another dominant theme in the literature is that the modeling of children's developmental outcomes requires a multilevel approach. Over the last two decades, researchers have shifted their attention towards understanding the effects on children's development of the social contexts in which they live, such as families, neighbourhoods, schools, and communities (Boyce *et al.*, 1998). Coinciding with this shift, statisticians have developed powerful *multilevel* statistical models that enable researchers to analyse hierarchical or nested data (Bryk and Raudenbush, 1992; Goldstein, 1995). As a result, researchers have recognized the need to collect data from several sources to adequately describe the

processes influencing the paths that children and youth follow. Table 2 summarizes some of the factors that have received attention in the literature.

The third theme, evident in the recent literature, is that *engagement is an important pre-cursor* to dropping out. The early research pointed to behaviour problems and poor academic performance as the most important predictors of dropping out. The recent research suggests that engagement in academic and school activities by both students and parents is a crucial determinant of a young person's long term academic success, and for some students, especially those with relatively low academic ability, it is the factor that distinguishes dropouts from graduates. This vein of research is relatively new, and although there is little doubt that engagement is important, defining it, quantifying it, and incorporating it into national data collection exercises is a difficult task. However, it may be the most important aspect of future data collection as it relates to a variety of intermediary outcomes, such as academic performance and behavioural/health problems. If we can better understand the process of, and find policies that promote engagement the incidents of under-achievement, poor behaviour/health and subsequent dropping out will surely decline.

Incorporating these three themes into a comprehensive approach calls for a "life course model" which is longitudinal, multilevel, and focused on developmental outcomes which are the key precursors to dropping out. Indeed, as our attention shifted from dropping out to the precursors of dropping out, we have come to view the act of dropping out as relatively unimportant compared with the ongoing development of the outcomes related to school success or failure. From this perspective, students do not drop out of school, they *fade* out. Our attention should turn to developing a better understanding of engagement, behaviour/health and achievement.

Table 2 **Dropout Data Requirements**

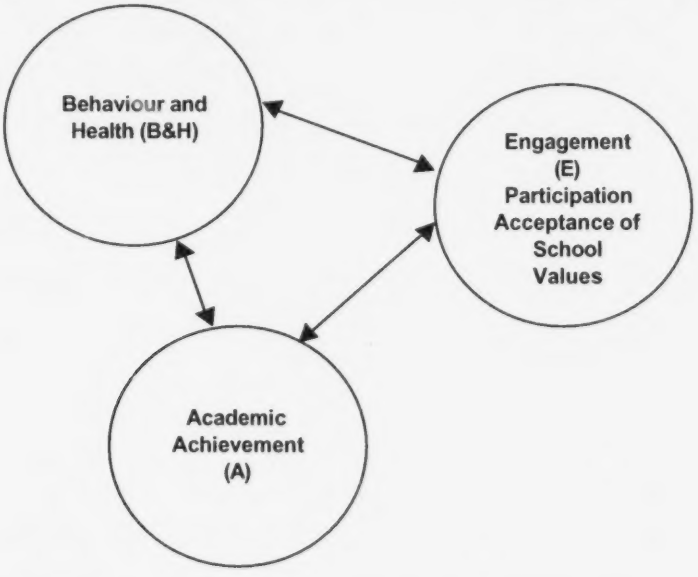
	Birth	Pre School	Age 5	Age 8	Age 12	Age 15	Age 19
Individual	Gender,race,birth weight,health status	Weight,Health status, nutrition, Cognitive ability, Care providers	Health and nutrit., cognitive ability,body mass index, anti-soc. behav., time use, attendance	Health and nutrit., cognitive ability, body mass index, anti-soc. Behav., time use, grades / retention attendance	Health and nutrit.,cognitive ability,body mass index, anti-soc. behav.,time use, grades / retention,attend. / truancy,aspirations detentions, authority probs.	Cgnitive ability, body mass index, anti-soc. behav., time use, grades/retention subjects/levels, attend. / truancy, aspirations detentions, authority probs., part-time work girl/boy friend, sexual activity	Body mass index, anti-soc. behav., time use, grades/retention subjects/levels, attend. / truancy, aspirations detentions, authority probs., part-time work own car girl/boy friend, sexual activity current status
Family	Mother smoked/ drank while pregnant, household comp. SES, parents' age	Parenting style, changes in household comp, SES, working status, activities with child	Parenting style, changes in household comp, SES, working status, activities with child, school involvement	Parenting style, parents' expect., changes in household comp, SES, working status, activities with child, school involvement, cultural index	Parenting style, parents' expect., changes in household comp, SES, working status, activities with child, childs confidence school involvement, cultural index	Parenting style, parents' expect., changes in household comp, SES, working status, activities with child, childs confidence school involvement, cultural index	Parenting style changes in household comp, SES, working status, activities with child, childs confidence school involvement, cultural index
Engagement			Teacher assmnts.	Teacher assmnts., partic. in school activities.	Teacher assmnts., partic. in school activities.	Teacher assmnts., partic. in school activities.	Teacher assmnts., partic. in school activities.
Peer network				Acceptance/ rejection, age and gender of friends	Acceptance/ rejection, age and gender of friends, activities exposure to cigs., alcohol, drugs	Acceptance/ rejection, age status and gender of friends, activities exposure to cigs., alcohol, drugs	Age status and gender of friends, activities use of cigs., alcohol, drugs
Schools			Size, composition, facilities student/staff activities, teacher quality	Size, composition, facilities student/staff activities, teacher quality discipline,	Size, composition, facilities student/staff activities / % participation, teacher quality discipline, assessments of interest, fairness	Size, composition, facilities student/staff activities / % participation, teacher quality discipline, assessments of interest, fairness	Size, composition, facilities student/staff activities / % participation, teacher quality discipline, assessments of interest, fairness
Community	Home postal code, housing tenure	Home postal code, housing tenure	Home postal code, housing tenure	Home postal code, housing tenure	Home postal code, housing tenure	Home postal code, housing tenure	Home postal code, housing tenure

Note: Home postal codes can be linked to census data (through GIS) to provide an excellent picture of the characteristics of the neighbourhood and community in which the young person lives.

3.2 A Basic Life-Course Model

In most analyses of children's development, or of the effects of classroom or schools, academic achievement is considered of primary importance, and is treated as the outcome or dependent variable. Factors like behavioural development or engagement are treated as independent variables, and considered important only if they successfully predict academic achievement. But from the perspective of understanding how children fade out of school, these factors have an equal status with academic achievement. Moreover, we cannot presume the causal direction implied by previous models, that poor behaviour/health and a lack of engagement leads to low achievement; indeed, the literature cited above suggests that a child experiencing academic failure may react with aberrant behaviour (which may be caused by a health problem) and become disengaged. Thus, we view the interplay among these three factors as the core of a life-course model of fading out. This is depicted in Figure 1.

Figure 1 **Three Key Developmental Outcomes Which Are Precursors to Dropping Out**



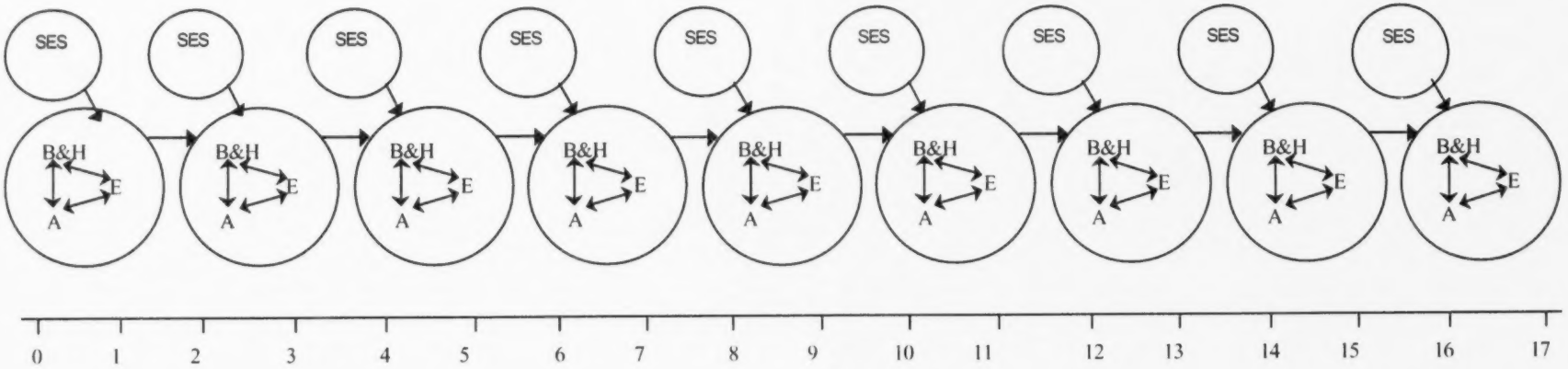
The starting point for understanding fading out or dropping out, from this perspective, is to discern how these three factors interrelate for children at a given stage in their schooling. We want to know the extent to which these factors vary among students, and the extent to which they co-vary or correlate at the individual level. With respect to behaviour problems, much of the emphasis in the literature on dropping out has been on aggressive behaviour and conduct disorders. A more comprehensive picture could be

attained by extending this to include prosocial behaviours, and a broader array of behavioural disorders. The literature on behaviour disorders distinguishes between internalizing disorders, such as anxiety and emotional disorders, and externalizing disorders, such as hyperactivity, inattention, and physical and indirect aggression. The prevalence of these disorders vary with age and sex during the schooling years (Willms, in press). Similarly, the literature usually refers to low achievers, but suggests that many children who drop out of schools are *under*-achievers; that is, have lower levels of academic achievement than would be expected of their cognitive ability. Understanding the difference between low achievers and under achievers is an important distinction and requires a better understanding of how they differ and respond to various interventions. We suspect that incorporating these constructs into our models would afford a better purchase on the relationships among behaviour/health, engagement and achievement, and help focus our attention on factors that could be ameliorated through intervention and educational policy.

The second step in achieving a life-course perspective is to adopt a "gradient" approach to the modeling of these outcomes. A "socioeconomic gradient" depicts the relationship between some developmental outcome and socioeconomic status (SES). In research on fading out or dropping out, we are concerned with how outcomes depicting engagement, behaviour/health and achievement are related to various aspects of socioeconomic status. The most important factors appear to be family income, the level of parents' education, and the prestige of their occupations. We also want to know the relationships between the set of outcomes and sex of the child, and family structure, particularly the size of the family and whether it is a single- or two-parent family. Also, there are probably significant interactions among these variables at different stages during the life course; for example, being brought up in a single-parent (usually the mother) family seems to have a stronger effect on the behaviour of boys than of girls (Lipman, Offord, Dooley and Boyle, in press).

The goal then of the second step is to achieve an understanding of how the socioeconomic gradients associated with these outcomes change over the life course from birth to age 17, and perhaps beyond. The model is depicted in Figure 2. (SES is used as a shorthand to embody socioeconomic status and family structure, and SES reflects that effects of various factors may be different on boys as compared to girls.) At each stage we are interested in the relationships among the three dominant precursors; their relationship with SES, family structure, and sex and how they relate to other factors such as school; and finally how these relationships affect the model at subsequent ages.

Figure 2 **Developmental Outcomes in a Life-Course Perspective**



3.3 The Basic Model in a Multilevel Framework

Willms (in press) has set out ten questions about socioeconomic gradients of childhood outcomes, which he considers central to the understanding of childhood vulnerability. The first five of these questions pertain to the timing, strength, and functional form of the within-community relationships between outcomes and SES for different types of children. The last five questions are multilevel. They are concerned with the extent to which gradients vary among communities, and the "mediating factors" which describe the processes underlying the relationships between childhood outcomes and family background. For the study of dropping out, these factors are mainly at the levels of family, schools, neighbourhoods, and local communities. Figure 3 depicts this model, and Figure 4 displays the full life course model. The model could include a separate level for peer groups, but at least for the purposes of multilevel modeling, we presume that these are subsumed under the levels of school and neighbourhood.

Figure 3 **Mediators of Socioeconomic Gradients**

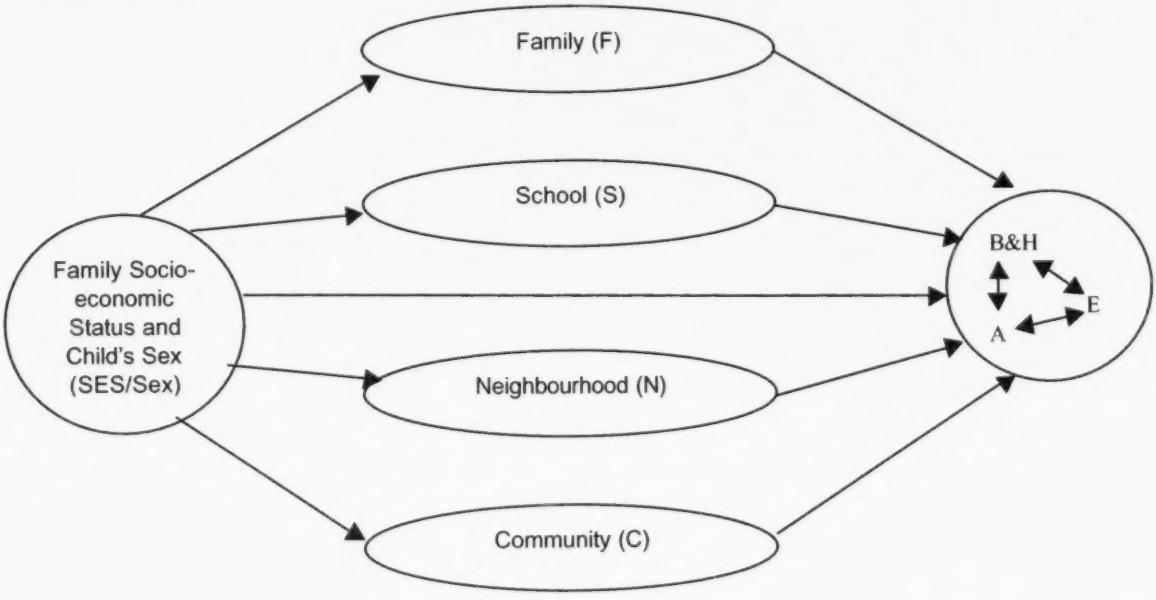
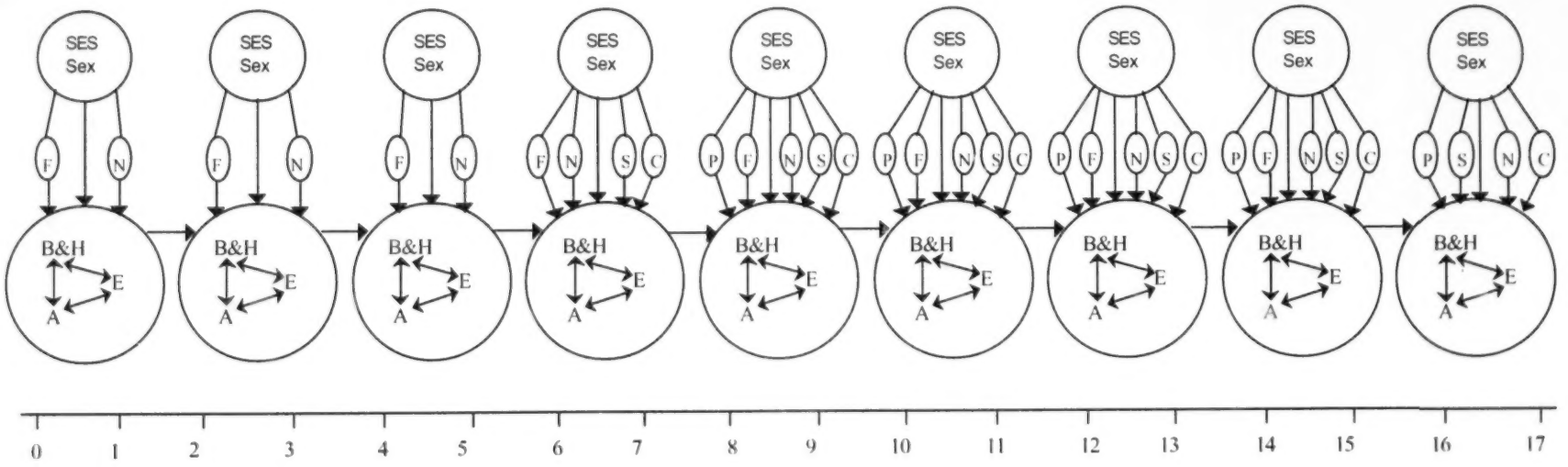


Figure 4 **A Life-Course Perspective on Dropping Out of School**



F=Family
N=Neighbourhood
P=Peer
S=School
C=Community

Figure 4 reflects the importance of various factors over time. Gender and SES have a constant influence on the engagement, behaviour and achievement. At birth and before entry into school, family and neighbourhood factors are thought to be the most important as they reflect the environment in which the child lives. Once the child enters school both school, peer and community effects begin to have more of an influence and as the child progresses through his/her teens the relative influence of parents becomes less pronounced.

If we could estimate a model like the one depicted in Figure 4, it would take us much closer to understanding the "complex interplay" among factors which lead to either graduation or dropping out. It suggests that the path to graduation – the horizontal arrows in the figure – is captured by individuals' trajectories of engagement, achievement, and behaviour; and these are affected the child's family background (SES and family structure), which tend to be fairly stable over time, and family, school, neighbourhood, peer-group and community factors, which can and do vary over the life course. It is these latter factors which are most important from a policy perspective, as these can feasibly be altered through interventions and reform.

The figure also underscores the fact that estimating such a model has enormous data requirements, and requires the integration of several complex statistical techniques, particularly structural equation modeling (Bollen, 1989; Jöreskog and Sörbom, 1988; Muthen and Curran, 1997), growth curve modeling (Willett, Singer and Martin, 1998), and multilevel modeling (Bryk and Raudenbush, 1992; Goldstein, 1995). We believe that this is virtually impossible, given the data that are currently available, and given the fact that software which integrate these statistical techniques are only presently being developed. However, we see the model as providing a framework for thinking about the dropout problem, and as a starting point for modeling the most important processes.

3.4 The Estimation of a Complex Life-Course Model

Given the complexity of this model, We believe that it needs to be approached in a piecemeal fashion. For example, it is possible to estimate the inter-relationships among engagement, achievement, and behaviour in two-year intervals, using data from the first two cycles of the NLSCY. With the data from the third cycle of the NLSCY (1998/99) it is possible to estimate growth trajectories for these three

constructs, covering five-year periods, which overlap and could cover the period from age 2 through 15. Boyle and Willms (in press) present a framework for analysing developmental data, which they describe as "measured variables of the same concepts assessed in temporal sequence on the same individuals." The framework incorporates growth curve modeling and multilevel modeling (but not structural equation modeling), and can be applied to either continuous outcomes (e.g., academic achievement) or dichotomous outcomes (e.g., remaining in school), which are measured in discrete time intervals. The multivariate aspect of our life-course model (i.e., three separate outcomes) can easily be incorporated into this framework by adding a level to the multilevel model which is intra-individual (see Thum, 1997). With such analsyes one could begin to ask such questions as: "Are schools which are successful in effecting high academic achievement also effective in terms of student engagement and prosocial behaviour?", "Are there critical transition points in the trajectories of achievement, behaviour, or engagement, and if so, does the timing of these vary among children?"

The findings from separate analyses of the age cohorts from the NLSCY could be combined into an *"accelerated longitudinal design"* (see Raudenbush and Chan, 1992). This technique shows that drawing cohorts from a wider age range can shorten the necessary period of data collection, provided there are sufficient 'age-points' over-lapping the individuals within the cohort. Raudenbush and Chan demonstrate this technique with data describing trajectories of deviance for separate cohorts of 11 and 14 year olds, which were followed over a five-year period. They argue that if there is a sufficient match of the trajectories in the overlapping years in the survey (in their case at ages 14 and 15), then the later years of the older group can be viewed as the likely trajectory of the younger group when they mature. In their example, this allowed them to cover an 8-year time frame with data collected over a five-year period with two cohorts.

While this general multilevel framework may be a good place to start, and would provide a "backbone" for other analyses, there are other techniques which would we believe might be fruitful (as follows).

3.4.1 Cluster analysis looking backwards

This technique will be useful to determine if there are different "types" of dropouts. Cluster analysis takes a particular outcome variable, in this case dropping out of school, and places individuals with

common characteristics into a variety of groups or clusters. Visually, this technique is appealing as the relative size and density of the clusters has a particular meaning regarding the size and influence of variables included in the analysis. This technique would be particularly useful in determining the extent to which dropouts can be divided according to Janosz's (1994) definitions. If this is possible, it would also give us a tangible estimate of the number of different kinds of dropouts, which would be especially relevant to the design of targeted interventions.

3.4.2 Simultaneous selection models

One theme stressed throughout this paper is that the dropping out of school prior to graduation is a process that begins at birth and there are number of milestones throughout the course of childhood and adolescence that are highly correlated with later school leaving. However, a number of the factors that would be used to predict later school leaving, will also have a significant impact on the intermediary effect. Heckman (1979) developed a simultaneous approach to side-step this problem. This is probably best explained with an appropriate example. Assume we are interested in understanding the role of anti-social behaviour at age 13 on the decision to leave school prior to graduation. However, we know that a number of the variables, such as SES, quality of schooling, parenting style and grades may affect both the propensity to participate in anti-social behaviour and the probability of dropping out of school, making interpretation of regression results impossible. Heckman suggests running a "selector" equation to predict the probability of participation in anti-social behaviour and using the residuals from this equation to calculate an "inverse Mills ratio" for each individual. This term is subsequently included in a second regression examining school leaving, which accounts for selection effects between anti-social behaviour and dropping out of school and produces a set of unbiased estimates of the influences on dropping out. The only requirement to run this model is that there is an exclusion restriction that must be met to identify the equation. A variable needs to be included in the selection equation that has a significant effect in the anti-social behaviour model, but does not significantly impact the dropping out of school model. If no such variable can be found, the model is said to be not identified and the estimates biased.

3.4.3 Natural and synthetic experiments

Econometricians have argued that modelling certain processes, in particular evaluating the effects of policy interventions or "treatments," are significantly biased by self-selection and as such, identifying "pure treatment effects" is difficult for most models. For instance evaluating the effect of a dropout prevention program is difficult as the at-risk individuals who choose to participate in the program are going to be a non-random sample of the total sample of at-risk young people. Natural experiments require some purely random assignment into a "treatment," with the distributive characteristics of those in receipt of the treatment being identical to the distributive characteristics of those not in receipt of the treatment. The principal complaint against natural experiments is that they are difficult to find in most large longitudinal databases and as such, most of the research conducted using these experiments is derived from small, sometimes highly idiosyncratic data sources, that may not be generalizable to a broader population. Heckman, Ichimura and Todd (1997) demonstrated a way to side-step the necessity of the random assignment of individuals into treatments. He proposed the use of synthetic experiments to predict receipt/non receipt of the particular treatment. The process involves running a simple predictive model (i.e. a probit) using a variety of explanatory variables to predict treatment/non-treatment. Once this equation is run, predicted values are generated to determine the likelihood of each individual taking the treatment and that individual is matched with the individual with the closest predictive value for being in receipt of the treatment, but in fact did not receive the treatment. The key point is that by matching on a variety of characteristics, the selection effects cancel out leaving a relatively straightforward estimation of the effects of the treatment on some desired outcome, such as staying in school, or academic achievement.

3.4.4 Peer networks

One aspect of youth experiences that has largely been unrepresented in most national longitudinal studies is the composition of the young person's peer network. Evidence presented earlier demonstrates that the peer networks of at-risk individuals tend to be different than those who are not deemed to be at-risk. At-risk young people tend to have more friends outside school and therefore fewer friends in school. They also tend to have older friends, who in many cases have dropped out themselves and are working. While the evidence clearly shows that peer networks are different, there is little evidence to

determine how peer networks interact with other variables and add to the predictive power of dropping out. One technique that could be employed is to ask the young person about a number of their closest friends and have them to provide several pieces of information about each, including their age, gender, current status (e.g. in school, working, unemployed), where and what activities they engage in together and how long they have been friends. This information should provide a good composite indicator of the individual's network and perhaps aid in the comprehension of the student's engagement at school. Young people with a high proportion of their close friends in the same school, may be less likely to drop out, as doing so would mean spending less time with their friends.

An important issue that has received only limited coverage in the literature on dropping out (see Crane, 1991) is the role of attrition and non-response in longitudinal databases. Dolton, Taylor and Werquin (forthcoming in 2000) have conducted a significant amount of research on survey attrition in the Youth Cohort Study for England and Wales, demonstrating that clear patterns of attrition and non-response exist in longitudinal studies of young people. There is evidence of a significant bias in those who ever bother to respond, with those who are socially excluded – that is, the individuals in which we tend to be most interested – being the least likely to participate.

4. Conclusions

This paper presents a review of the literature relevant to the predictors of students dropping out of school, and argues that a life-course model is required to extend this work further. One of the dominant findings of this literature is that children who have poor academic achievement and behaviour problems are more likely to leave school before graduating. This is also an emerging literature that suggests *engagement* in schooling, which is characterized by the extent to which students' participate in academic and non-academic activities, and identify with and value the goals of schooling, is an important precursor to dropping out.

The literature pertaining to these findings indicate that these processes begin early, really at birth. Our life course model tries to shift the emphasis away from dropping out to these three dominant precursors – academic achievement, behaviour, and engagement. We maintain that the act of dropping out is much less important than the gradual withdrawal from school that most dropouts exhibit prior to leaving school. Thus, we believe that an understanding of how these three outcomes are related at different points in a child's school career are essential to understanding the processes leading to dropping out.

Another dominant finding of the extant literature is that children from lower socioeconomic backgrounds and single-parent families are more likely to drop out. Also, males and certain ethnic minorities tend to have higher dropout rates. Thus, we argue that the next step in a life course approach is to understand the relationships between the three outcomes and family background at various ages. These relationships are referred to as socioeconomic gradients.

The recent literature on dropouts has emphasized the role that the context in which a child develops has important effects beyond those attributable to family background. Schools are undoubtedly the most important context, but neighbourhoods and larger communities can also play a significant role. The quantitative research in this area has emphasized the importance of a multilevel approach, which can tease out the independent effects of family background from the effects associated with schools or other communities. Qualitative studies have probed deeper into the individuals' backgrounds and emotions, and reveal that dropouts tend to experience rejection, feel disenfranchised from the school, believe that their teachers do not care about them, and think that the cards are stacked against them. They also

suggest that dropouts have peer networks that differ considerably from those who remain in school. Thus, our full life-course model calls for integrating data from various levels, including the family, school, neighbourhood, and local community, to assess their effects on levels of the three primary outcomes and on socioeconomic gradients.

We recognize that the state of the art in data collection and the development of complex statistical techniques falls short of enabling researchers to estimate the kind of complex life-course model we propose. However, in Canada, where we have an integrated set of longitudinal studies, we can make considerable progress towards these aims. We have recommended a strategy for how this analysis might proceed using data from the NLSCY, and suggest a number of other strategies that could complement these efforts. This research could fulfil two objectives that are essential for shaping social policy: the early identification of children and youth at risk generally, and of dropping out, based on more precise predictors than low academic achievement or low SES; and the development of a framework for assessing whether particular policy options or interventions have an effect.

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